

## Program for Early Aspects: Aspect-Oriented Requirements Engineering and Architecture Design Workshop

8:45-9:00 Introduction to workshop (start 15 minutes earlier!)  
Bedir Tekinerdogan

### 09:00 -- 10:30 Presentation Session

#### Aspectual Requirements Engineering

**Moderator:** Ana Moreira

9:00-9:15 Finding Aspects in Requirements with Theme/Doc  
E. Baniassad, S. Clarke  
9:15-9:30 Integrating the NFR framework in a RE model  
I. Brito, A. Moreira  
9:30-9:45 Tracing aspects in goal driven requirements of  
process control systems  
I. El-Maddah, T. Maibaum

#### Aspect-Oriented Architecture Design

**Moderator:** Bedir Tekinerdogan/Paul Clements

9:45-10:00 Generating Aspect-Oriented Agent Architectures  
U. Kulezsa, A. Garcia, C. Lucena  
10:00-10:15 Identifying Aspects Using Architectural Reasoning  
L. Bass, M. Klein & L. Northrop  
10:15-10:30 Problems, subproblems and concerns,  
M. Jackson

10:30 -- 11:00 *Morning break*

After the presentations we will follow with the discussion sessions. The goal of the discussions is to describe a complete life-cycle aspect-oriented approach to software system engineering that seamlessly bridges early aspects, design/implementation aspects, and aspects during deployment. The given example case will be used to illustrate the ideas.

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## 11:00 -- 14:30 Discussion Session I – Key Problems and Motivations

11:00-12:30 Discussions in sub-groups

**Moderator:** Bedir Tekinerdogan

**Goal:** Provide a common agreement on the identified problems;

**How:** Use the example case study together with the given and/or new scenarios and define in a concrete way what the most fundamental problems are within each group.

Split the group into four sub-groups:

- A. Requirements Engineering
- B. Software Architecture Design
- C. Domain Engineering/Application Domain
- D. Specifying Early Aspects

The sessions should deliver (1) a *mindmap* and (2) a *set of problem descriptions*:

(1) **Mindmap:** Draw one mindmap that shows the context of the described problems/domain. A mindmap represents related ideas and concepts (see Appendix B).

(2) The problems should be described in the following form:

**Problem:** describe textually what the problem is.

**Why is it a problem?:** Motivate why this is a fundamental problem.

**Example:** Use the example case to explain the problem. You may use scenarios here.

12:30 -- 14:00 *Lunch*

14:00 - 14:30 Plenary Session: Presenting Fundamental Problems + Plenary discussions

**Moderator:** Ana Moreira/Paul Clements

Results of Discussion I are presented plenary and shortly discussed.

The problems are ordered in the life-cycle model.

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## 14:30-16:30 Discussion Session II – Promising Solutions

14:30-15:30 Discussions in sub-groups  
*Regroup the previous sub-groups to pollinate the ideas*

**Moderator:** Ana Moreira/Paul Clements

**Goal:** Show potential solutions for the presented problems.

**How:** Provide a list of solutions using the example case.

The session should deliver a set of solution descriptions. A solution description should be in the following format:

**Solution:** Describe the solution to the fundamental problems in session one.

**Knowledge Domain:** List the related knowledge domains/related work for this solution

**Example:** Use the example case to explain the solution. If no solution exists yet, describe the possible ways for finding a solution.

**Fail Criteria:** describe when the solution will fail

**Open issues:** Describe what needs still to be done; open issues/consequences

15:30 - 16:00 *Afternoon break*

16:00 – 16:30 **Plenary Session:** Show the result of Session II (Solutions)

**Moderator:** João Araújo

The solutions will be presented in the following order:

- A. Requirements Engineering
- B. Software Architecture Design
- C. Domain Engineering/Application Domain
- D. Specifying Early Aspects

In this way we will aim to show the complete early-aspect life cycle.

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### **16:30 – 17:00 Discussion Session III - Setting the Research Agenda**

16:30-17:00 Discussions in sub-groups

**Goal:** Describe the open problems/research issues that *must be* addressed in the coming years with respect to early aspects topic

**How:** Provide a list of research topics.

*What should be in the research agenda of early aspects? Show with example case.*

17:00 - 17:30 *Plenary Session: Presenting the Research Agenda for next years*

**Moderator:** João Araújo

## **Appendix A: Case - Design of an Examination Assistant System (EAS)**

A software company aims to deliver products for automatic support for examination systems. Examination systems can be applied for a wide range of domains including assessment of courses at the primary school, university, or any kind of domain in which questioning and assessments are required (examination for drivers' lessons, IQ-tests, etc.). The tutor should have the opportunity to select different question types including multiple choice questions, alternative choices, open-ended, fill in the blanks, match the items and order items question types. The tutor must be able to customize the selected question types and edit/update/delete instantiated questions. There should be a mechanism to define the order in which the questions need to be answered. In addition the tutor may need to monitor the students while answering the questions.

Timing constraints can be imposed on the duration of question, response time and individual elements in the question content. The tutor must be able to provide answers to the related questions. The answers will be dependent on the question types.

There must be means to set evaluation criteria and grade the answers to the questions. Grading may depend on various factors such as the student's characteristics (age, class, background knowledge etc.). Timing may be an important parameter for the grading as well. The system may support the student in answering the questions. This may be based on simple hints or very complex guidance in which the solution domain is provided.

### **Example scenarios:**

- Change UI
- Add logging of student operations
- Add monitoring
- Change the student profile
- Change question types
- Etc.

## Appendix B - How to Mind Map



A mind map consists of a central word or concept; around the central word you draw the 5 to 10 main ideas that relate to that word. You then take each of those child words and again draw the 5 to 10 main ideas that relate to each of those words.

The Mind Map has four essential characteristics:

1. The subject of attention is crystallized in a central image.
2. The main themes of the subject radiate from the central image as branches.
3. Branches comprise a key image or key word printed on an associated line. Topics of lesser importance are also represented as branches attached to higher-level branches.
4. The branches form a connected nodal structure.

Tony Buzan, p59 "The Mind Map Book" BBC Books 1995

So, begin by putting the main topic or point of focus in the center of the page, use keywords. Think three-dimensionally. Don't get stuck in one area. If you dry up in one area go to another branch. Break boundaries. If you run out of space, don't start a new sheet; paste more paper onto the map. (Break the 8x11 mentality.)

Be creative, get involved and have fun.

## Participants

1. Mehmet Aksit
2. João Araújo
3. Elisa Baniassad
4. Lynne Blair
5. Isabel Brito
6. Gary Chastek
7. Siobhan Clarke
8. Paul Clements
9. Islam El-Maddah
10. Iris Groher
11. Charles Haley
12. Michael Jackson
13. Tomoji Kishi
14. Uirá Kulesza
15. Robin Laney
16. Hafedh Mili
17. Ana Moreira
18. Jianxiong Pang
19. Awais Rashid
20. Miguel-Angel Sicilia
21. Sergio Soares
22. Daniel Speicher
23. Dominik Stein
24. Stan Sutton
25. Bedir Tekinerdogan